

Review of Factoring

GCF

ex 1:

$$3x^2 + 6x = 0$$

$$3x(x + 2) = 0$$

$$\begin{array}{lcl} 3x = 0 & x + 2 = 0 \\ x = 0 & x = -2 \end{array}$$

Regular

$$ax^2 + bx + c = 0$$

ex 2:

$$x^2 - 2x - 8 = 0$$

+c same sign

-c different signs

$$x^2 \overset{\text{stretch}}{-4x} + 2x - 8 = 0$$

$$x(x-4) + 2(x-4) = 0$$

$$(x-4)(x+2) = 0$$

$$\begin{array}{lcl} x-4 = 0 & x+2 = 0 \\ x = 4 & x = -2 \end{array}$$

$$\begin{array}{c} -8 \\ -4 \quad +2 \\ -2 \end{array}$$

$$x^2 - 2x - 8 = 0$$

When a = 1

No stretch

$$(x-4)(x+2) = 0$$

$$x = 4 \quad x = -2$$

ex 3:

$$6x^2 - 11x - 10 = 0$$

$$6x^2 - 15x + 4x - 10 = 0$$

$$3x(2x-5) + 2(2x-5) = 0$$

$$(2x-5)(3x+2) = 0$$

$$\begin{array}{lcl} 2x-5 = 0 & 3x+2 = 0 \\ x = \frac{5}{2} & x = -\frac{2}{3} \end{array}$$

ex 4:

$$8x^2 + 14x + 5 = 0$$

$$8x^2 + 10x + 4x + 5 = 0$$

$$2x(4x+5) + 1(4x+5) = 0$$

$$(2x+1)(4x+5) = 0$$

$$x = -\frac{1}{2} \quad x = -\frac{5}{4}$$

ex 5:

$$4x^2 + 13x + 10 = 0$$

$$4x^2 + 10 = -13x$$

$$4x^2 + 13x + 10 = 0$$

Patterns

$$\text{i. } a^2 - b^2 = (a-b)(a+b)$$

$$\text{ii. } a^2 - 2ab + b^2 = (a-b)^2$$

$$\text{iii. } a^2 + 2ab + b^2 = (a+b)^2$$

ex 6:

$$4m^2 + 4m + 1 = 0$$

$$(2m + 1)^2$$

ex 7:

$$x^3 - 12x^2 + 36x = 0$$

$$x(x^2 - 12x + 36) = 0$$

$$x(x-6)^2 = 0$$

$$x = 0$$

$$x = 6$$

$$x = 6$$

ex 8:

$$y^2 - 49 = 0$$

$$(y + 7)(y - 7) = 0$$

$$y = -7 \quad y = 7$$

$$\begin{array}{l} y^2 - 49 = 0 \\ \sqrt{y^2} \quad \sqrt{49} \\ y = \pm 7 \end{array}$$

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$